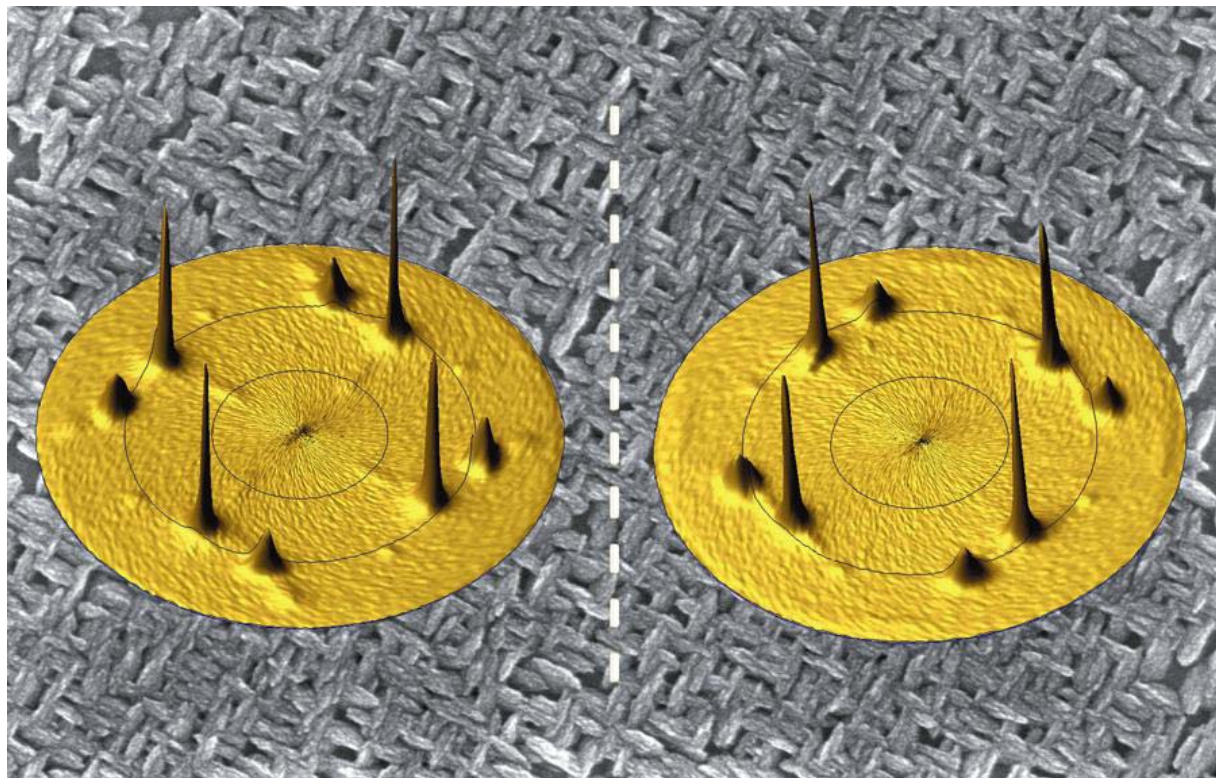


Enantiospecific Electrodeposition of a Chiral Catalyst

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Chiral films of CuO were electrodeposited onto achiral gold using tartrate ion as the chiral imprinting agent. The CuO was also shown to be an enantiospecific catalyst for oxidation reactions. In the future, the chiral films will be used for the synthesis and sensing of chiral pharmaceuticals.



X-ray pole figures of chiral CuO.
Background is SEM of CuO film.
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Many biomolecules are chiral -- they can exist in one of two enantiomeric forms that only differ in that their structures are mirror images of each other. Because only one enantiomer tends to be physiologically active while the other is inactive or even toxic, drug compounds are increasingly produced in an enantiomerically pure form using solution-phase homogeneous catalysts and enzymes. Chiral surfaces offer the possibility of developing heterogeneous enantioselective catalysts that can more readily be separated from the products and reused. In addition, such surfaces might serve as electrochemical sensors for chiral molecules. Jay A. Switzer and co-workers at the University of Missouri-Rolla show in the October 2 issue of *Nature* that chiral surfaces can also be produced through electrodeposition. Electrodeposition is an inexpensive, relatively simple solution-based process that resembles biomineralization in that organic molecules adsorbed on surfaces have profound effects on the morphology of the inorganic deposits. When electrodepositing a copper oxide film on an achiral gold surface in the presence of tartrate ion in the deposition solution, the chirality of the ion determines the chirality of the deposited film, which in turn determines the film's enantiospecificity during subsequent electrochemical oxidation reactions.